PLUS★WARE® NEWS

DEDICATED TO BUSINESS ANALYSIS GRAPHICS

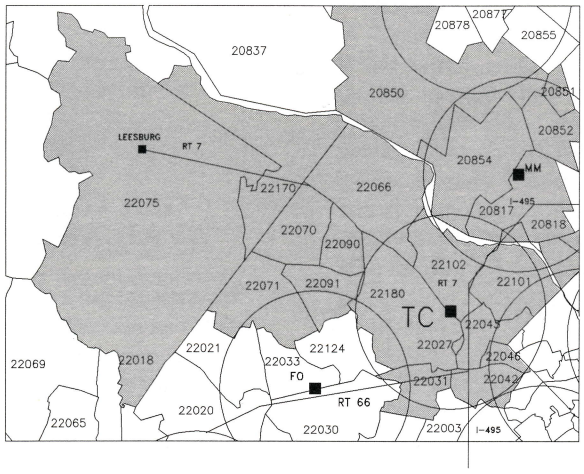
Winter 1988 Volume 2, No.1

ATLAS★GRAPHICS™ HELPS MAJOR RETAILER DEVELOP COST-EFFECTIVE DIRECT MAIL CAMPAIGNS

The holiday season is a busy time for everyone involved in the retail industry. This past year Bob Massie, Retail Accounts Manager for Hecht's, a major Washington D.C. based retail chain, was able to make his job a little easier with STSC's ATLAS★GRAPHICS mapping software.

One of Massie's primary tasks is to solicit new credit accounts. He uses direct mail campaigns, mailing flyers to potential customers which demonstrate the benefits of a credit account. The chain he works for has twenty-four stores in an area made up of parts of Maryland, Pennsylvania, Virginia and the District of Columbia, containing a population of approximately 2 million households. Within this mailing area are over 600 zip codes.

Massie's staff must determine, among other things, which zip codes contain potential customers, which zip codes have been mailed a particular promotion, and what the return is from specific codes. In the past, his staff of 30 had put in many hours manually constructing maps to indicate the targeted areas of the direct mail campaigns and the success of the various marketing efforts in those areas.



Hecht's uses ATLAS★GRAPHICS to target market areas around their store locations for direct mail campaigns.

Direct mail campaigns are a science. Audiences must be carefully targeted for specific promotions and the mailings must appeal to the characteristics of those audiences. These mailings also must have the potential to realize a sizable return. It is highly detailed work to compile and track this data and be able to access it readily in an easy to understand format for those who are not directly involved in the task. A map is the ideal format for displaying this information.

Hecht's uses ATLAS★GRAPHICS with the zip code boundary files for the tri-state area and the District of Columbia. The program is run on an IBM PS/2 and the resulting maps are printed on an HP LaserJet printer. Before acquiring ATLAS★GRAPHICS, Hecht's was drawing maps by hand, overlaying territories with data in a time consuming process. Massie estimates that by using ATLAS★GRAPHICS, the time needed to compile data on a single map was cut by a third. More importantly, his staff can now construct maps that would have been impractical or impossible before.

Hecht's develops target areas based on the demographics of store locations and the major arteries leading to the stores. By placing this information on a zip code boundary map, they are able to easily ascertain the zip codes to which to direct their mailings. Demographic information such as income level, the number of family or single households and age distribution help the marketing team create mailings that will appeal to the area's population. Demographic data files (such as "1987 Median Household Income" and "Buying Power Index") are available through STSC and STSC's authorized dealers, though Massie makes use of specific data of interest to him that is compiled by his own marketing department.

The staff is able to evaluate the effectiveness of the mailings through the use of map-oriented data analysis. As responses come in, they are tabulated and the results are put on a map showing the return percentage for each zip code. If an area reflects a modest response rate, the mailings can then be modified to attract those potential customers. A good response would indicate the potential for future marketing efforts.

Using ATLAS★GRAPHICS has also helped Massie prepare reports for meetings with senior executives. He can clearly show the range and effectiveness of the direct mail campaigns and help the management team plan the strategy for future mailing efforts. They enable Massie to clearly define his activities and their results. According to Massie, one of the strongest attributes of ATLAS★GRAPHICS is its ease of use. He bought the package this past fall to help out with the holiday season's mailings. "I had it up and running over the course of a weekend and gave a presentation using the maps on Monday morning," notes Massie.

Continued on page 2

Hecht's uses ATLAS*GRAPHICS

Continued from page 1

The speed and ease with which presentation quality maps can be produced makes ATLAS*GRAPHICS a strong decision support tool. Actual and hypothetical scenarios can be explored almost as soon as they can be thought of and the data entered into the computer. These maps can help develop cost and time estimates as well as anticipating returns based on the response from similar targeted areas.

The graphic on page 1 shows a marketing area along part of the Virginia/Maryland border. The map depicts marketing areas around some of the chain's store locations, three of which can be seen on this map. This data, overlaid on a zip code map gives Hecht's the targets for direct mail campaigns to support the indicated store venues.

Massie is able to do these calculations quickly since all changes or variations in data are reflected immediately. This way he is easily able to plot the path and results of his mail campaigns just by entering the data in the computer. ATLAS*GRAPHICS overlays this data on a map in a few minutes, saving his staff many hours of tedious drawing while increasing the accuracy of the finished product. This decision support capability from a business analysis graphics product like ATLAS*GRAPHICS gives added power to the presentation aspects of the package.

Hecht's use of ATLAS*GRAPHICS supports and facilitates the planning, implementation, analyzing, decision support, and presentation functions of the new account department's direct marketing efforts. Retailers of almost all products can utilize its presentation and decision support capabilities to guide and shape their marketing efforts. Most importantly for Bob Massie, it made the 1987 holiday season a little less hectic.

PLUS★WARE® NEWS

PLUS*WARE NEWS is published four times a year by STSC, Inc., and is distributed free of charge to registered licensees of the STATGRAPHICS Statistical Graphics System and ATLAS*GRAPHICS Mapping Software. All correspondence to the newsletter should be sent to:

Ed Beemer, Editor
STSC, Inc.
2115 East Jefferson Street
Rockville, MD 20852
301-984-5000

Copyright © 1988 STSC, Inc. All rights reserved. Printed in U.S.A.

STATGRAPHICS is a registered trademark of Statistical Graphics Corporation. ATLAS*GRAPHICS, developed by Strategic Locations Planning, is a trademark of STSC, Inc. PLUS*WARE and APL*PLUS are registered trademarks of STSC, Inc. All prices quoted in this newsletter are for he U.S. and Canada. International prices slightly higher.

SUPPORT CORNER

Note: Users outside the U.S. should contact their local dealers for pricing information and the availability of patches and other materials described in this column.

STATGRAPHICS 2.6 PATCH

In early copies of STATGRAPHICS 2.6, in the Multifactor Analysis of Variance (ANOVA) procedure, if the number of interactions is greater than one, a VALUE ERROR will result. If you have one of these copies, you may obtain a patch which will correct the problem by calling the HELPLINE (301-984-5489) and leaving your name, address, telephone number and serial number on the answering machine, specifying that you want the ANOVA patch. This patch is only available to registered users of version 2.6.

FREE ATLAS*GRAPHICS PATCHES STILL AVAILABLE

Patch files to bring your ATLAS*GRAPHICS 2.1 up to the most current version are available free to all registered users. The latest version is version 2.14. To receive your free patches, call the HELPLINE (301-984-5489) and leave your name, address, telephone number and serial number on the answering machine, specifying that you want the ATLAS*GRAPHICS patch.

Please let us know if you are a Mapedit user with the Custom Boundaryedit when sending in your request. You must be registered to receive the patches. You may send your completed registration card with your request.

GSS GRAPHICS DRIVERS FILE AVAILABLE FOR STATGRAPHICS

We have recently received from Graphics Software Systems (GSS) an updated version of the DRIVERS.EXE file. This version contains modifications which improve the behavior of certain device/operating system interactions. If you have been having trouble installing STATGRAPHICS 2.6 or have had difficulty getting a particular device (video display, printer or plotter) to work correctly, this new DRIVERS.EXE file may help you. You may obtain a copy by leaving your name, address, telephone number and serial number on the answering machine (301-984-5489), specifying that you want the new DRIVERS.EXE file. This file is only available to registered users of version 2.6.

Continued on page 3

SUPPORT CORNER

Continued from page 2

HELPLINE TRAFFIC STILL INCREASING

Traffic on the HELPLINE phones continues to grow. This is due partly to our steadily growing customer base. We are finding, however, a growing tendency among users to pick up the phone before checking the documentation.

You may have seen in the press that companies are finding it harder to provide unlimited support to software users. Please help us to continue providing this service by only calling when the answer cannot be found elsewhere. Whenever possible, try the on-line help files and the supplied documentation. Nine times out of ten, your answer is contained in one of these sources.

PLUS★WARE USER WINS HAWAIIAN VACATION AT FALL COMDEX

Steven Bernstein, a STATGRAPHICS and APL*PLUS System user from San Diego, won the STSC Hawaiian Vacation Giveaway at the Fall COMDEX in Las Vegas this past November. Steve uses STATGRAPHICS in his work in the marketing department at San Diego Gas & Electric for time series forecasting and projections. He has been using STATGRAPHICS since it was first published. Steve also uses the APL*PLUS System for economic modeling. We wish Steve and his family a wonderful vacation. Congratulations!

PLUS★WARE PRODUCT INFORMATION LINES

ORDERS	
U.S.	800-592-0050
Maryland	301-984-5123
International	301-984-5412
Telex	898085 STSC ROVE
Telefax	301-984-5094
Product Updates	301-984-5129
Product Information	301-984-5123
Technical Support (HELPLINE)	301-984-5489

TREASURE CHEST I

OVERLAYING CHARTS IN STATGRAPHICS

Randy Bartlett
Quality Assurance Specialist

One of the many useful features in STSC's STATGRAPHICS Statistical Graphics System is the ability to overlay two or more graphs. Certain relationships between data are more easily understood if viewed graphically. When these data are depicted in formats which have a related basis, i.e. an x-y axis, they can be compared by laying one graph over the other. For example, a stock broker can easily compare a particular stock's change in daily value to its quarterly earnings by overlaying a plotted line (value) over a histogram (earnings).

Another example, which we will explore here, is to determine what distribution fits a sample best. This example will show that, besides using valuable tools like the chi-square test, you can gain further insight by overlaying plots to examine your data. What follows is a step-by-step outline of how to create an overlay graph using STATGRAPHICS, version 2.6. The data used in this example is included on your Sample Data Sets disk.

Once on the main menu type "**DSTFIT**" and press **ENTER**. When you are in the Distribution Fitting Panel, type "**mpg**" in the "Data vector" field. (The variable "mpg" contains mileage ratings for 155 cars.)

In this example, we will first fit a normal distribution to the data. Since the normal distribution (14) is the default choice in the "Distribution number" field, you can press **F6** at this point.

STATGRAPHICS calculates and displays estimates for the mean and standard deviation of the distribution, and allows you to modify the results. In this example, we will use the estimates provided by the system, so press **F6** again and a pop-up menu will appear.

Highlight **Histogram** and press **ENTER**. Tab three times to the "Top Title" field. Press **ENTER** and type "**Normal Fit vs Erlang Fit**" on the second line. Retype "**MPG**" and "**FREQUENCY**" in upper case on the following lines. Then press **F6** to use the other default settings on the Tabulation Input Panel. This displays a frequency histogram for the sample data "mpg" and draws the calculated normal distribution line overlaid for comparison.

Before continuing with the analysis, we will change some of the graphics settings and save the graph. Press **F5** and select **Graphics options**. Tab to the block of fields under "Types". Type "**4**" in column 1 of the "fills" row.

Continued on page 4

Continued from page 3

Press **F6** and select **Replot.** The graph shown in Figure 1 will be displayed. Now press **F3** to save this graph.

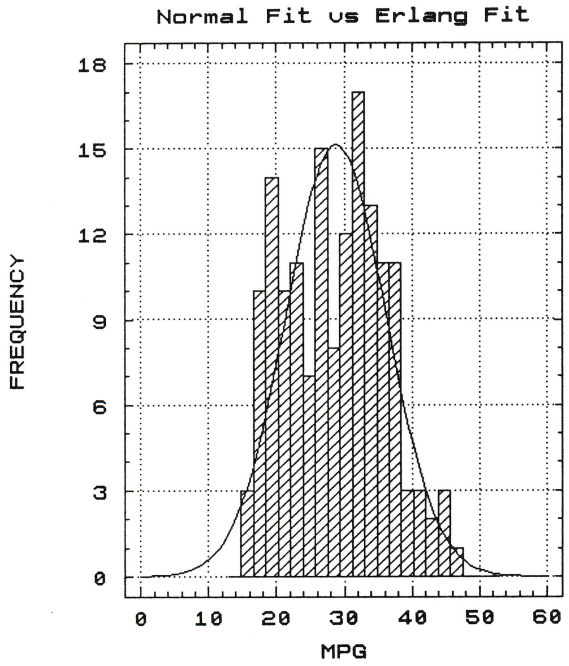


Figure 1: mpg fit to a normal curve

The program will assign the next available replay file number to the graph or you can use one of your own. Remember this number as you will need it later. Type "**NORMAL MPG**" in the comment space and press **ENTER**.

Press **ESC** twice to return to the pop-up menu. Highlight **Chi-Square test** and press **ENTER**. On the Tabulation Input panel press **F6** to use the defaults. The chi-square compares the observed (actual) frequencies in your data (in this case, "mpg") to the expected (the calculated line) frequencies. The chi-square value for the current example is 27.2294 with 11 degrees of freedom and a significance level of 4.424225E-3.

Now, let's fit the data to an Erlang distribution. Press **ESC** until the initial Distribution Fitting panel is displayed. In the "Distribution number" field, change the "14" to "**9**" and press **F6.** We will use the parameter estimates calculated by the system. Press **F6** again and then highlight **Histogram.** Press **ENTER.** Then press **F6** to display the frequency histogram.

Now we want to prepare and save the second graph so that we can overlay the two graphs and compare the fits. The overlay will be easier to read if we remove the histogram fill on the second graph and change the line type used to plot the Erlang distribution. To do this press **F5** to display a menu of graphics modification options. Highlight **Graphics options** and press **ENTER.** Tab to the block of fields under "Types." Type "**2**" in column 1 of the "Lines" row to change the line type from solid (1) to long dash (2). Then press **ENTER** twice to move to the "Fills" fields. Type "**0**" in column 1 of the "Fills" row to change the fill type to blank. Press **F6**, highlight **Replot** and then press **ENTER.** As you can see the histogram (Figure 2) is no longer filled and the fit line is now plotted with a dashed line. Press **F3** to save the graph.

Select an appropriate replay file number, and type "**ERLANG MPG**" in the comment field and press **ENTER.** We have now saved the two charts that we are going to overlay.

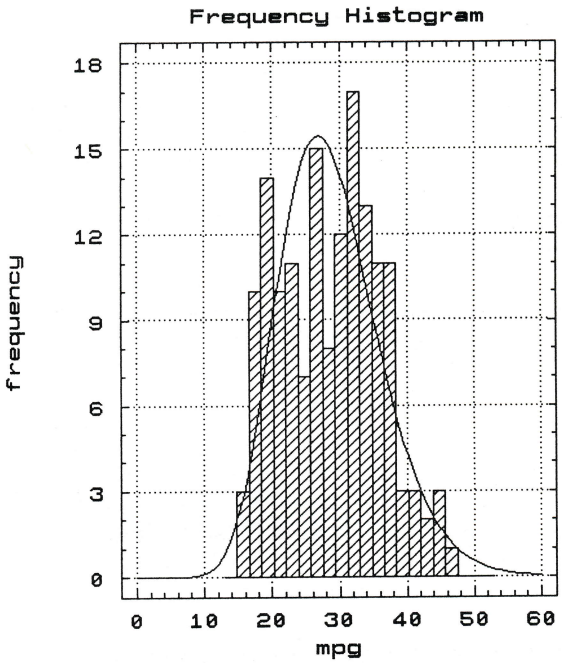


Figure 2: mpg fit to an Erlang curve

Before we overlay the two graphs, let's run the chi-square test for the Erlang distribution. Press **ESC** until the pop-up menu appears. Highlight **Chi-square test** and press **ENTER.** On the Tabulation Input Panel, press **F6** to accept the defaults. The chi-square statistic for this distribution is 21.4804 with 11 degrees of freedom and a significance level of .0287225.

To compare the results of the two chi-square tests, look at the significance levels. The Erlang distribution has a significance level of 0.0287, indicating a better fit than the normal distribution with a significance of 0.0044.

Press **CTRL-BREAK** to return to the main menu. Let's overlay the two charts we created previously. Type "**Overlay**" and press **ENTER.** When the Splitscreen/ Overlay panel appears, type your first replay file number in the first row of the "Row 1/Column 1" field. Press **ENTER** and type the second replay file number in the second row.

Press **F6** to draw the overlaid graphs. The result displays the frequency histogram for "mpg" along with the curves for the normal distribution and the Erlang distribution (Figure 3). Note that only the axes and titles from the first graph are displayed on the overlaid graph. Thus, when saving graphs to be overlaid, you should enter appropriate titles with the first graph before saving it, as we did here. Or, after the overlaid graph is drawn, use the graphics

Continued on page 6

BULLETIN BOARD

"POSTPLOT" AND "SLIDES" NOW AVAILABLE WITH ATLAS*GRAPHICS

Two new programs are now available for use with ATLAS*GRAPHICS.

SLIDES allows you to put on a "slide show" by displaying a series of maps on the screen, each map remaining visible on the screen for a chosen number of seconds.

POSTPLOT is an easy to use program module that allows you to save maps so that they can be plotted on a device connected to another computer (similar in function to PostPrint for printers). This is useful for users who have to plot maps on devices attached to someone else's computer. PostPlot may be used on any plotter that can be configured to work with the most current version of ATLAS*GRAPHICS.

To get a copy of these two programs, you must be a registered ATLAS*GRAPHICS user. U.S. users should send $35 for shipping and handling to STSC, Inc., Attention Orders Department. Users outside the U.S. should contact the dealer where they bought ATLAS*GRAPHICS for pricing and availability. Currently, these programs are provided on an "as-is" basis and are not supported by the STSC HELPLINE.

HP7510A FILM RECORDER TO BE DISCONTINUED

Hewlett-Packard has discontinued the HP7510A film recorder. Therefore, version 2.13 and later of ATLAS*GRAPHICS no longer supports this film recorder. If you already have this device and need support for it, please call the STSC HELPLINE at (301) 984-5489.

SUPPORT FOR OLDER VERSIONS OF STATGRAPHICS TO END

IMPORTANT: Support for STATGRAPHICS versions prior to version 2.6 will no longer be available after April 15, 1988. Update your current version to 2.6 today. The STATGRAPHICS 2.6 update includes a complete new set of software, a new tutorial, over 200 pages of new documentation, and a new reference card, menu map and keyboard template. Users of Version 2.0 or 2.1 can upgrade to Version 2.6 for $125 (U.S. and Canada). Users of any Version 1 system can upgrade for $325. International customers should contact the dealer where they bought STATGRAPHICS.

STATGRAPHICS TRAINING

Statistical Graphics Corporation, the developers of STATGRAPHICS, will continue offering a series of seminars in 1988 in Princeton, New Jersey. Their 1988 course schedule is:

Interactive Data Analysis using STATGRAPHICS
($650, 2 1/2 days)

March 21-23
May 16-18
July 18-20
October 17-19

STATGRAPHICS for Quality Control Professionals
($650, 2 1/2 days)

March 23-25
May 18-20
July 20-22
October 19-21

Statistics for the Experimental Scientist
($800, 4 days)

August 8-11

Process Improvement through the Design of Experiments
($850, 4 days)

September 26-29

Discounts are available for companies sending more than one person to a particular seminar or sending one person to both the Interactive Data Analysis and the Quality Control seminar. Seminars to be held at your company site are also available. To register, or for more information, call Cindy Gorman, Statistical Graphics Corporation at (609) 924-9374.

APL CLASSES

Some STATGRAPHICS users find STSC's APL*PLUS System for the PC an ideal tool for performing customized analyses. Those interested in learning more about this powerful programming language are invited to attend the following classes. (All classes are at STSC headquarters, Rockville, MD unless otherwise noted.)

March 7-11	Intermediate APL
March 28 - April 1	Intermediate APL Orange Coast College Computer Center 2701 Fairview Road Costa Mesa, CA
April 18-22	Introduction to APL

Classes are $225 per day. To register and for more information call Bonnie Hardy (301) 984-5131.

TREASURE CHEST I

Continued from page 4

modification options described in Section 4-4 of the *STATGRAPHICS User's Guide* to make the necessary modifications.

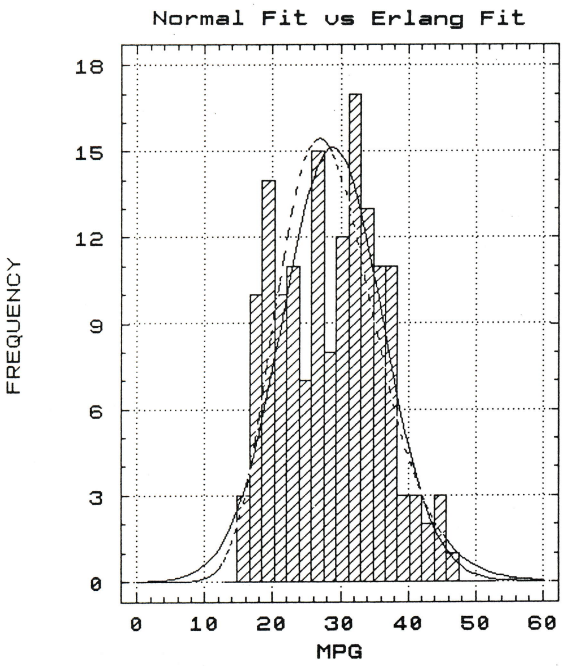


Figure 3: Comparison of Erlang and normal curve fits for mpg

Examining the graph, we see that the Erlang distribution (the dotted line) adheres to the data better than the normal distribution. This is because the normal distribution is symmetrical, and our data is not. The Erlang fitted line has less area under the left tail of the curve, matching the data there; and the area under the right curve is greater than the normal distribution, again matching our observations better. As you can see, overlaying two graphs helps you quickly analyze the best fit and to present your findings.

TREASURE CHEST II

CREATING BIVARIATE MAPS IN ATLAS*GRAPHICS

Curtis Schwartz and Sam Cabahug
Quality Assurance Specialists

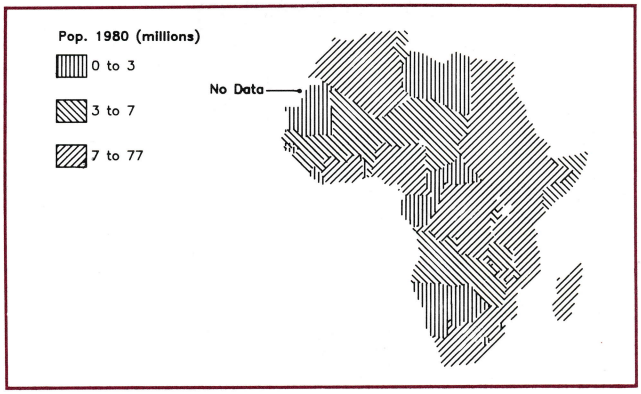
One bivariate map can have considerably more impact than two separate maps when analyzing the relationship of two or more variables that pertain to the same region. For example, planners often need to represent current and projected figures on the same map to analyze trends for policy making. ATLAS*GRAPHICS is the only PC mapping software that provides this useful capability.

The steps in creating a bivariate map are: 1) create and save an image of the first map; 2) create the second map; 3) load back into memory the image of the first map; 4) overlay the two. The process may be repeated as necessary when dealing with more than two variables. In the following example, we will create a simple two-variable map and show how to display the result on three different output devices.

Create your first map in the usual way, using data from the first variable. **Tip:** If you expect to deal with many data ranges, you may want to save space on the screen by compressing the legend spacing (in the **Legend-Options** screen). With the map on the screen, use **Slide-Save** to save an image of this first map. **Tip:** If you expect to modify this first map later on, save a version of it using **Mapfile-Save**. Remember that maps saved under **Slide-Save** are merely images and cannot be edited when they are redisplayed.

Create your second map using data from your second variable, making sure that the legend descriptions do not fall in the same place as those of the first map. (You can control the placement of legends in the **Configure-Map-Contents** screen.) **Tip:** To speed up the mapping process, eliminate things on the second map that have already been taken care of on the first map. For example, if your first map already contains the map titles and subtitles, leave these blank on the second map. You may also turn off the region outlines of the second map in the **Configure-Map-Boundaries** screen.

Now use **Slide-Load** to bring back into memory the image of your first map. (You will receive a message prompting you that the image you just loaded is not the current map.) Use **Plot-Overlay** to see your bivariate map on the screen.



This map shows the 1980 population for the nations of Africa.

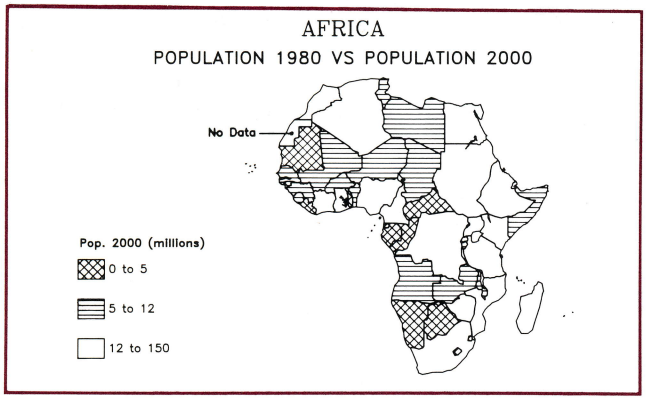
TO CREATE A BIVARIATE MAP ON YOUR PLOTTER

Creating a bivariate map on the plotter is more straightforward. Make your first map as you did earlier. When done use **Plot-Plotter** to send this to your plotter. Create your second map, then WITHOUT REPLACING THE PAPER on your plotter, use **Plot-Plotter** again to draw this second map over your first one. Some plotters slightly push out the paper from the tablet after plotting the first map. Before plotting the second map, make sure the paper is resting firmly against the paper guides/stops.

Continued on page 7

TREASURE CHEST II

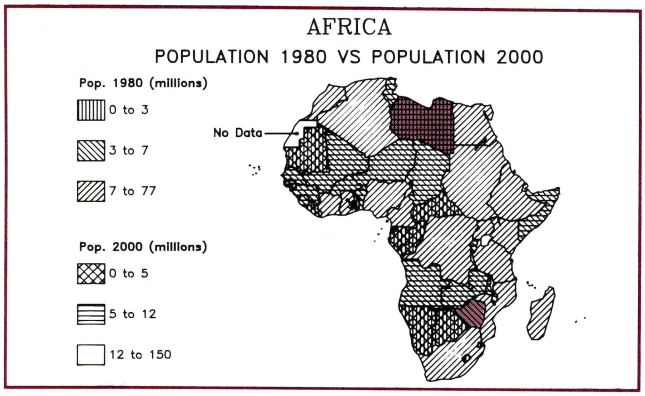
Continued from page 5



This map shows the estimated population of the same region in the year 2000.

TO CREATE A BIVARIATE MAP ON YOUR PRINTER

Create your first map as before, then save it using **Plot-File**. Create your second map and save it with **Plot-File** under a different filename. Exit ATLAS*GRAPHICS and go to Postprint. Use the **Load-Overlay** command to enter the names of your two files, then print out the bivariate map with the **Plot-Graphic Printer** command.



This map is the bivariate map which shows the two sets of population figures. While estimates indicate that the population will double in most regions, an even faster rate of growth is forecast in the two highlighted countries.

Q & A

Q In ATLAS*GRAPHICS, when I import points in BoundaryEdit, they appear as large filled squares that are unacceptable for my presentations. Can these be changed?

A Definitely. After importing the points in BoundaryEdit, go into ATLAS*GRAPHICS and enter the Configure-Map-Boundary screen. You will have the option of changing the Point Color (15 color choices, plus "off" for no color), Point Symbol (26 different symbols), and Point Size (ranging from 1 thru 16). Use the Left and Right cursor movement keys to flip through the different choices in each of the aforementioned fields.

Q For a less cluttered look on my ATLAS*GRAPHICS output, how do I display just the first three digits of the region labels in my 5-digit zip code map?

A First, go into BoundaryEdit-Edit. Next, type in the desired boundary filename. Then choose "Names" from the menu. Put your cursor on the column of Secondary Names and press **F6** to trim characters from the right side of the names. In this case, you should then enter "**3**" so that you retain the first 3 digits of the 5 digits in the ZIP code. Be sure to press **F10** and then Save the boundary file.

Now you can go into ATLAS*GRAPHICS Text-Labels-Option screen and change the Name field from the default "Primary" to "Secondary" to display the truncated secondary name on the map. (Remember that Region Labels should be turned on in the Configure-Map-Contents screen.)

Q In ATLAS*GRAPHICS, I'd really prefer to have the secondary names appear in the DataEdit spreadsheet while working on my county data files; the county code means nothing to me. Is this possible?

A Yes, but note that county codes are unique, whereas a given county name may be used in different states of the country. (This is why the county codes were used as primary names.) If you will be working on only a small area of the country where you know there are no duplicate county file names, you can use the procedure described below to put the county names in your spreadsheet. Go into BoundaryEdit-Edit. Next, type in the desired boundary filename. Then choose **Names** from the menu. Put the cursor on the Primary Name column and press **F4** to copy the county names (from the Secondary Name column) over the county codes. When done, we recommend you save this new file using a different file name so you retain a copy of the original. You may now go into DataEdit, choose **Edit-New**, and then type in the name of this new boundary file; the county names should now appear in the left column instead of the county codes.

Q How can I use a STATGRAPHICS operator to randomly select a subset of observations from a variable? Can I apply the same technique to randomly shuffle data in a variable?

A Sometimes it is very useful to generate a list of random numbers. The "?" in STATGRAPHICS generates a random number between 1 and a number you specify. To demonstrate press **F8** from the main menu and type **EXEC**.

Continued on back page

Q & A

Continued from page 7

Enter the following in the EXEC window:

? 10 produces one random number between 1 and 10 (e.g., 7)

? 10 10 produces two random numbers from two separate sets of 1 to 10 (e.g., 3 & 10)

2 ? 10 produces two random numbers from one set of 1 to 10 (e.g., 5 & 1 or 2 & 2)

The random number generator can be combined with the index operator, expressed as [*r,c*] and the RESHAPE operator to generate random data. To randomly select *m* number of observations from a variable (*var*) of size *n*, create a new variable that contains the results of the selection by typing:

(from one set)

a GETS var[m ? n]

(from *m* sets)

b GETS var[? m RESHAPE n]

(to randomly shuffle a complete variable and store the results in a new variable)

c GETS var[n ? n]

To look at the contents of the new variable, type in the name of the new variable and press **ENTER**. The variable is now stored in the "workarea" and can be used in other procedures or written to a file using the File Operations Update procedure. For more information, see Section 5-6 in the *STATGRAPHICS Users Guide.*

Q I have had to connect my EGA card to a monochrome screen while my Enhanced Color Display is being repaired. What driver should I use with STATGRAPHICS 2.6 for this set up?

A You should continue to use the EGA driver in your CONFIG.SYS, but before entering STATGRAPHICS, type **"SET EGA=MONO"**.

This will tell the driver to run the EGA for a monochrome screen. This command must be run from DOS in the exact syntax shown above before entering STATGRAPHICS. Other optional settings for specific drivers are found in Appendix F of the *STATGRAPHICS User's Guide.*

STSC

STSC, Inc.
2115 East Jefferson Street
Rockville, Maryland 20852

Return Postage Guaranteed

BULK RATE
U.S. POSTAGE
PAID
PERMIT NO. 4590
ROCKVILLE, MD 20850